Math Diagnostic **Name:**

Calculate the following:

1. $2^3 =$
2. $\frac{1}{2} \div \frac{1}{3} =$
3. $\frac{1}{2} + \frac{1}{3} =$
4. $9^{-\frac{1}{2}} =$
5. $|-8| =$
6. $-8 \bullet -4 =$
7. $\frac{98^{17}}{98^{16}} =$
8. 2:3 = 4:
9. $2(2x+3) =$
10. $8 - 2 \bullet 4 =$
11. 20% of 50 =
12. 4! =
13. $\log_4 16 =$

Solve the following. Please show all work.

14. Rewrite 3,400,000 in scientific notation:

15. List 2 factors of 8 and 2 multiples of 8.

Factors: Multiples:

16. Solve for *x*: $9 - 5x \leq 1$

17. Solve for *x*: $\frac{2x+7}{5} = 13$

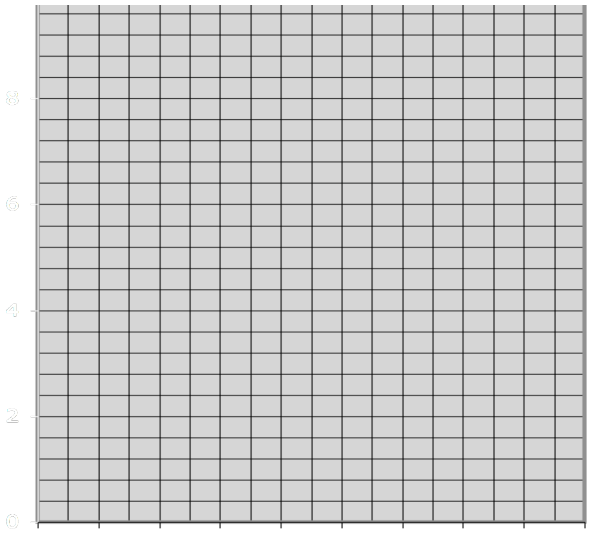
18. Solve for *x:* $x^2 + 12x = -20$

19. Consider the equation $y = -2x + 3$

a. If $x = 5$, what does y equal?

b. If $y = 1$, what does x equal?

c. Sketch the graph in the space provided below.



20. Solve for x and y:

$$5x + 2y = 19$$
$$2x - y = 4$$

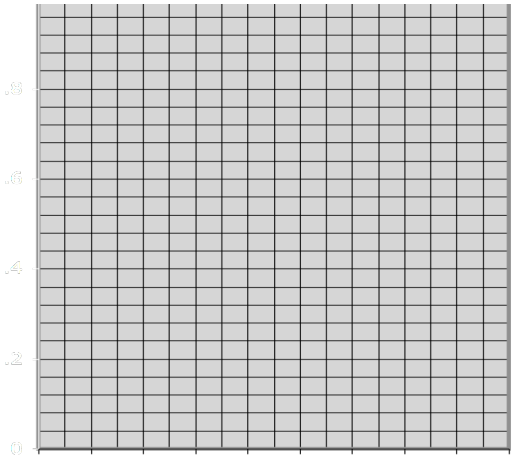
21. Consider two equations

$Q = 100 - 5P$

$Q = 50 + 5P$

a. Solve for Q and P.

b. Graph the two equations.



22. The first equation is a demand curve with P representing price in dollars and Q representing quantity in tons. Describe in words what the 5 in the equation means.

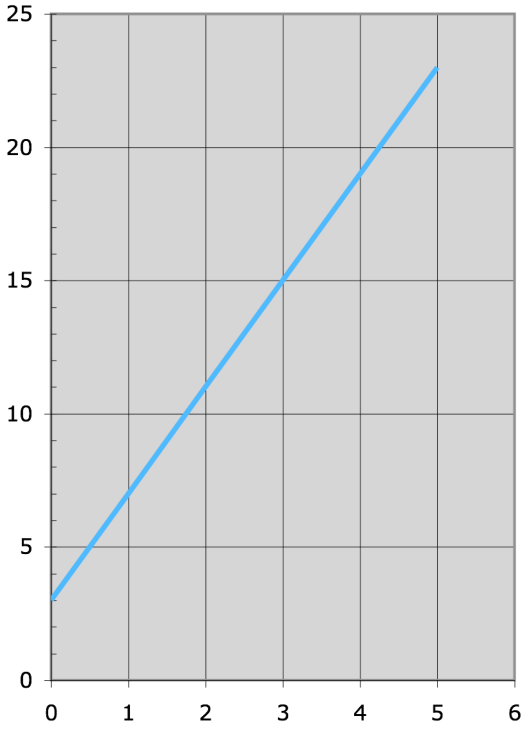
23. Consider the following set of numbers: 0,1,1,2,4,5,8

a. What is the mean?

b. What is the median?

c. What is the mode?

24. Use the graph below to answer the following questions:



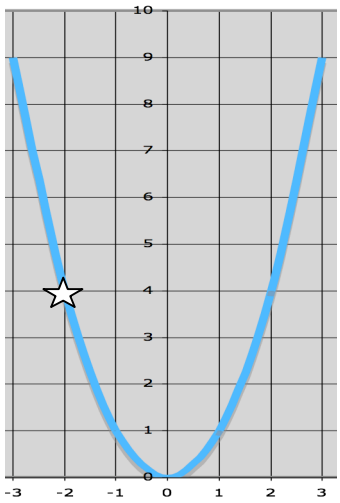
a. What is the y-intercept of the line?

b. What is the slope of the line?

c. Write the equation for the line in y-intercept form.

25. On a particular day an airport currency exchange stand offers these terms for changing dollars into euros: You pay a fixed $2 exchange fee and get 0.81 euro for each dollar. Write down the equation that tells you how many euros (E) you get for a given number of dollars (D).

26. Use the graph below to answer the following questions:



a. What are the coordinates of the star?

b. What is the equation of the line?

27. The population of a country is currently 20 million and is growing at 10% per decade.

a. How large will the population be after 30 years?

b. How long will it take the country's population to double, given its current growth rate of 10%? (Hint: You can write this in log form)